PRELIMINARY

Notice : This is not a final specification
Some parametric are subject to change.

INKE111BC1

Built-in Zener Diode
MOS field-effect transistor
Silicon N-channel

DESCRIPTION

INKE111BC1 is a silicon N-channel MOS transistors with built-in Zener diode , and small package.

FEATURE

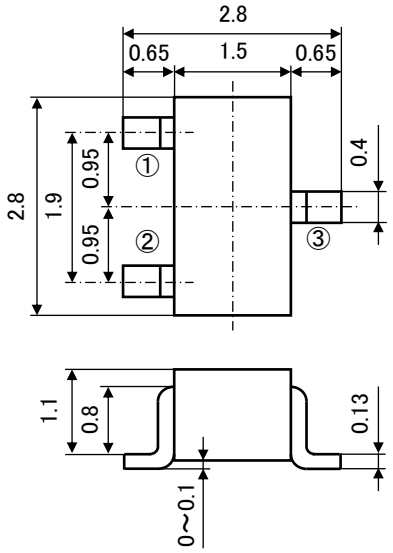
- Low on Resistance.
  $R_{DS(ON)}$=1.5Ω(TYP) @I_D=250mA,V_{GS}=3.2V
  $R_{DS(ON)}$=1.1Ω(TYP) @I_D=500mA,V_{GS}=4.0V
  $R_{DS(ON)}$=0.7Ω(TYP) @I_D=500mA,V_{GS}=10V
- High speed switching.
- Drive voltage 4V
- Built-in Zener diode between drain and source.
- Small package for High-density packaging.

APPLICATION

High speed switching, analog switching, and others.

OUTLINE DRAWING

UNIT : mm



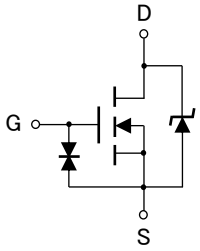
TERMINAL CONNECTER
①: GATE
②: SOURCE
③: DRAIN

JEITA : SC-59
JEDEC : Similar to TO-236

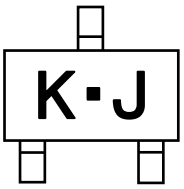
MAXIMUM RATINGS (Ta=25℃)

Symbol	Parameter	Rating	Unit
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Drain Current(DC) ※1	0.5	A
I_{DP}	Drain Current(Pulse) ※2	1.5	A
P_D	Total Power Dissipation	200	mW
		450※1	mW
I_{AV}	Avalanche Current ※3,4	1.0	A
E_{AV}	Avalanche Energy ※3,4	1.0	mJ
T_{ch}	Channel Temperature	+150	℃
T_{stg}	Storage Temperature	-55～+150	℃

EQUIVALENT CIRCUIT



MARKING



※1 : Package mounted on glass-epoxy substrate (19mm×45mm×1mm)
※2 : PW≦1ms, Duty≦1%
※3 : Consecutive pulses PW≦10μs, Duty≦1%
※4 : L=1mH

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【MOSFET】ELECTRICAL CHARACTERISTICS (Ta=25℃)

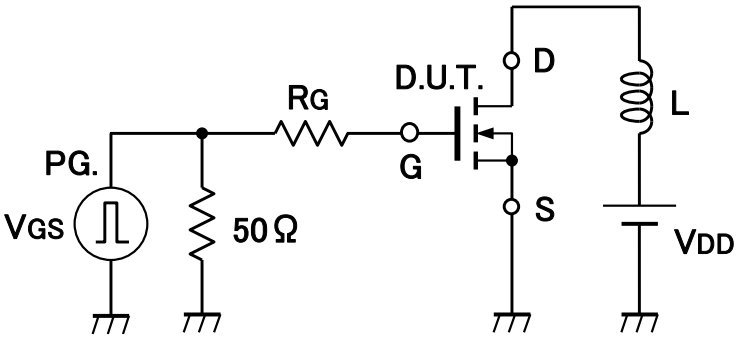
Symbol	Parameter	Test Condition	Limit			Unit
			MIN.	TYP.	MAX.	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D=100μA, V_{GS}=0V	40	–	60	V
I_{GSS}	Gate-Source Leak current	V_{GS}=±20V, V_{DS}=0V	–	–	±10	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V	–	–	1	μA
V_{th}	Gate Threshold Voltage	I_D=250μA, V_{DS}=V_{GS}	1.0	–	2.0	V
$R_{DS(ON)}$	Static Drain-Source On-State Resistance	I_D=250mA, V_{GS}=3.2V	–	1.5	–	Ω
		I_D=500mA, V_{GS}=4.0V	–	1.1	–	
		I_D=500mA, V_{GS}=10V	–	0.7	–	
C_{iss}	Input Capacitance	V_{DS}=5V, V_{GS}=0V, f=1MHz	–	110	–	pF
C_{oss}	Output Capacitance		–	24	–	
C_{rss}	Return Capacitance		–	8	–	
t_{on}	Switching Time	V_{DD}=20V, I_D=200mA V_{GS}=0～5V	–	50	–	ns
t_{off}			–	65	–	

【Zener Diode】 ELECTRICAL CHARACTERISTICS (Ta=25℃)

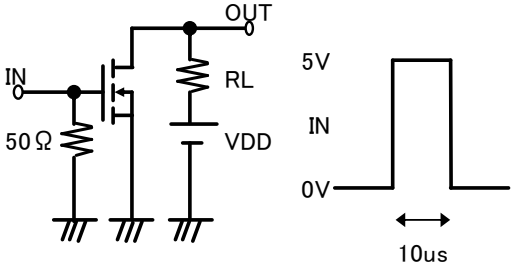
Zener Voltage Vz(V)			Reverse current I_R(μA)	
MIN	MAX	Iz(mA)	MAX	V_R(V)
40	60	0.1	1.0	40

Avalanche current test condition

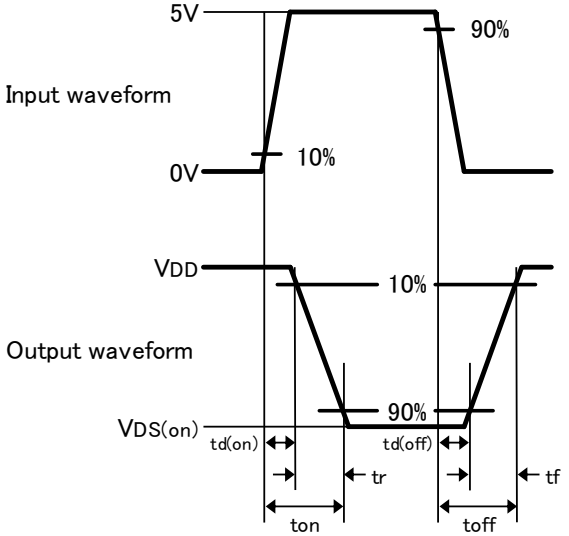
Ta=25℃
RG=25Ω
VDD=20V
VGS=10→0V
L=1mH



Switching time test condition



Duty ≦ 1%
入力 : tr, tf < 10ns
VDD = 20V
ソース接地
Ta = 25℃



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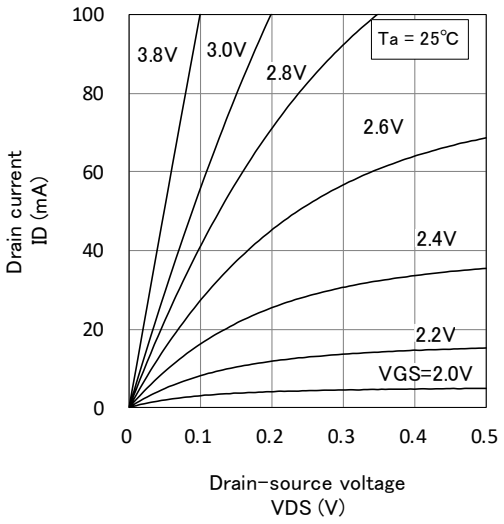
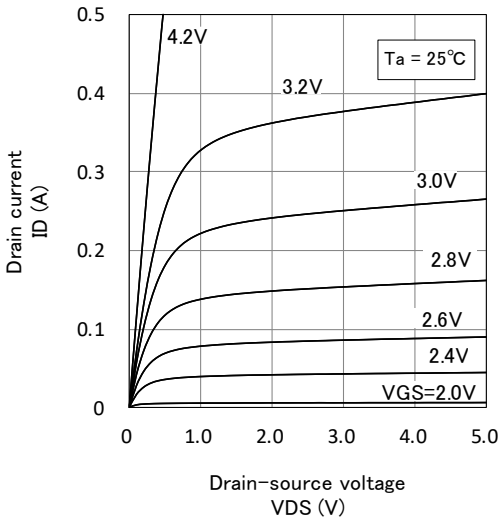
TYPICAL CHARACTERISTICS

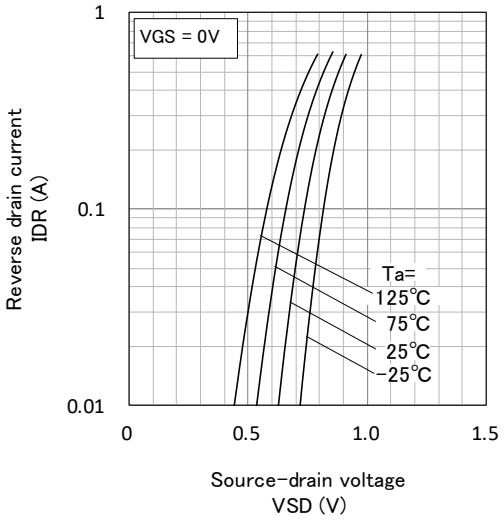
ID – VDS(Low Voltage Area)



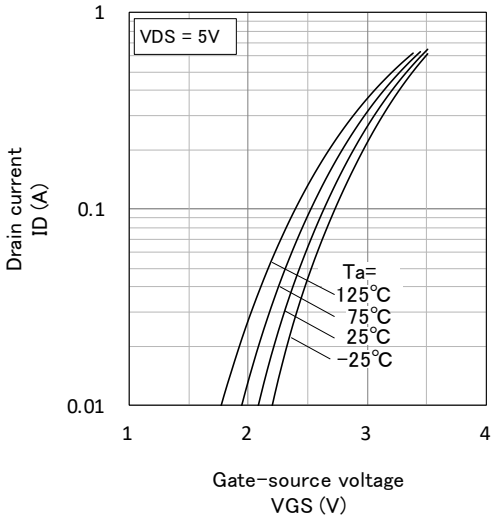
ID – VDS



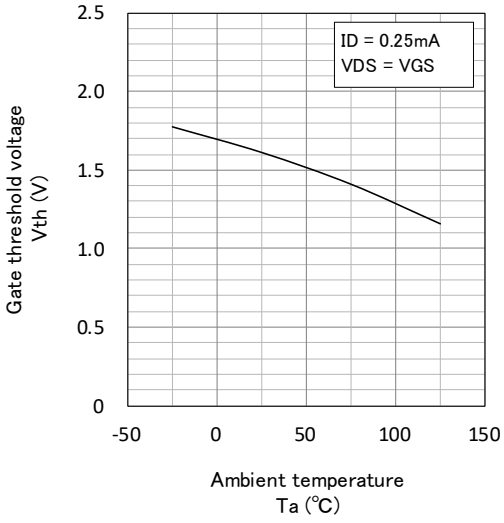
IDR – VSD



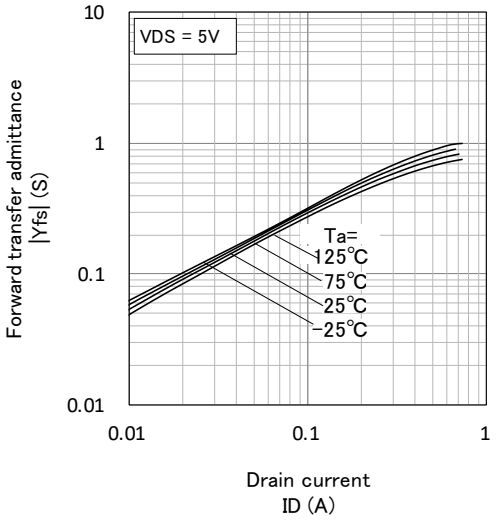
ID – VGS



Vth – Ta



|Yfs| – ID



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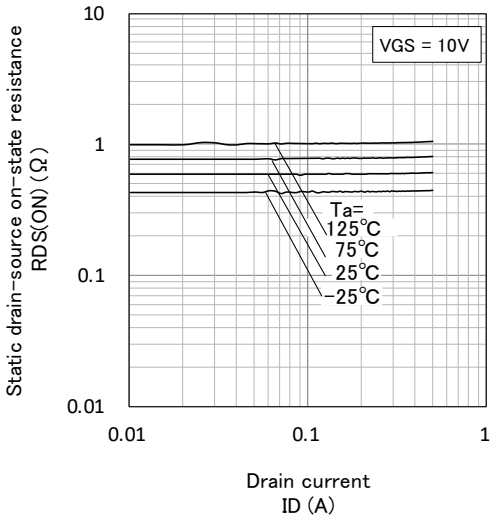
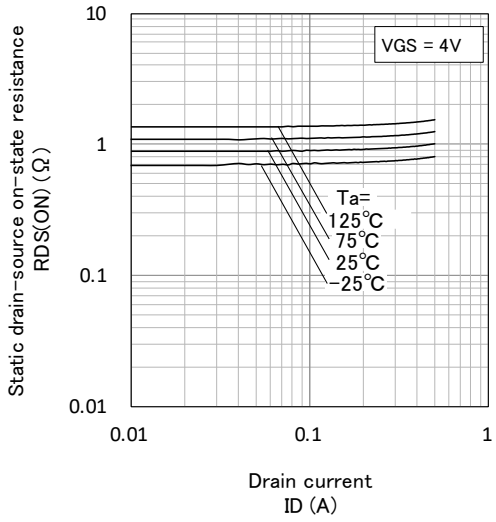
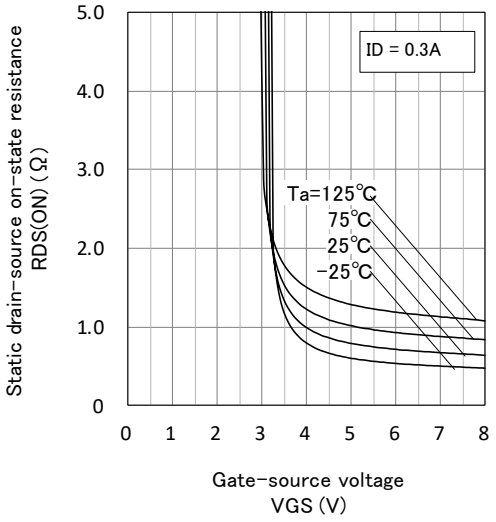
RDS(ON) – ID



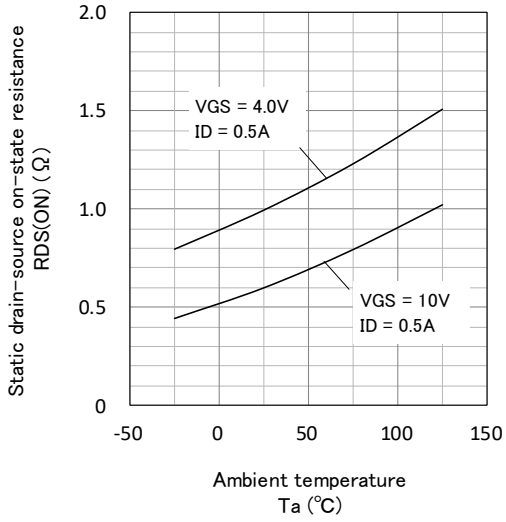
RDS(ON) – ID



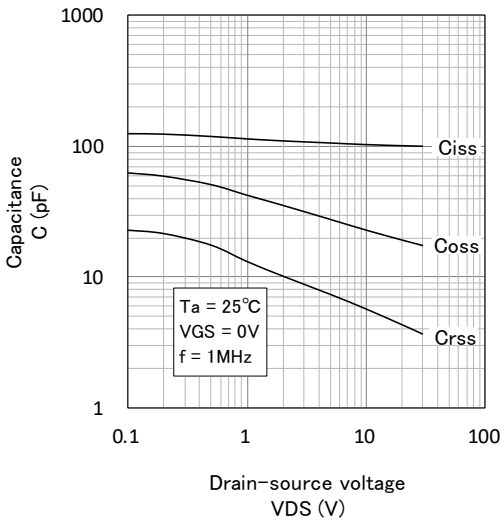
RDS(ON) – VGS



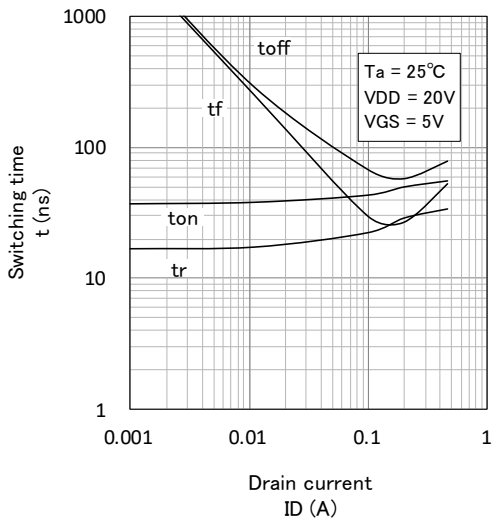
RDS(ON) – Ta



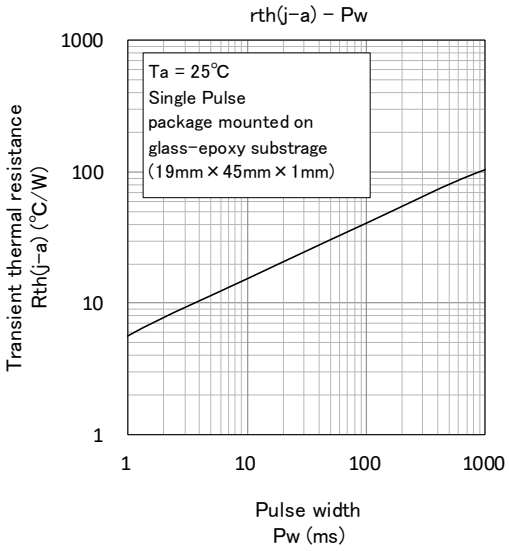
C – VDS

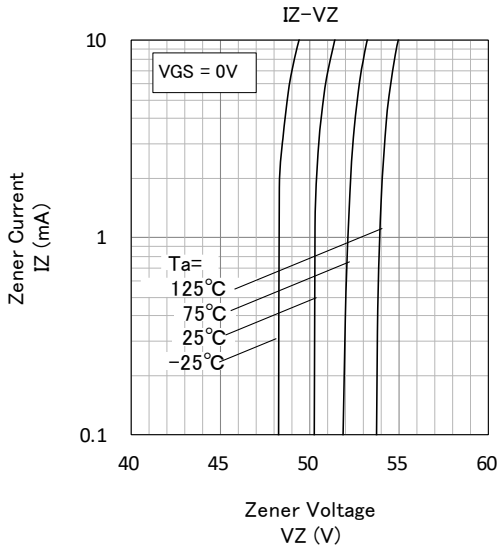


t – ID



INKE111BC1


rth(j-a) - Pw
Ta = 25℃
Single Pulse
package mounted on
glass-epoxy substrage
(19mm×45mm×1mm)
Transient thermal resistance
Rth(j-a) (℃/W)
1000
100
10
1
1
10
100
1000
Pulse width
Pw (ms)


IZ-VZ
VGS = 0V
Ta=
125℃
75℃
25℃
-25℃
Zener Current
IZ (mA)
10
1
0.1
40
45
50
55
60
Zener Voltage
VZ (V)

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